



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/518,923

07/12/2005

Christophe Bureau

033339/286546

7277

826

7590

08/19/2008

ALSTON & BIRD LLP

BANK OF AMERICA PLAZA

101 SOUTH TRYON STREET, SUITE 4000

CHARLOTTE, NC 28280-4000

EXAMINER

CLARK, GREGORY D

ART UNIT

PAPER NUMBER

4152

MAIL DATE

DELIVERY MODE

08/19/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/518,923	Applicant(s) BUREAU ET AL.	
	Examiner GREGORY CLARK	Art Unit 4152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/12/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 and 21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 17-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/12/05</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-8, 17-20, drawn to a solid support comprising a functionalized electrically conductor or semiconductor surface.

Group II, claim(s) 9-16, drawn to a process to functionalize an electrically conductive or semiconductor solid support surface.

Group III, claim(s) 21, drawn to a method for bonding objects to conducting or semiconductive solid support surfaces by means of surface chemical reactions.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The groups contain a common technical feature that of a conducting or semiconducting surface functionalized with electrografted polymeric species. The common technical feature does not provide a

contribution over the prior art because the common technical feature is disclosed in *WO 02/098926* to Bertrand who teaches a process for depositing by electro-grafting a strong adherent polymer coating on an electrically conductive surface comprising an electrochemical grafting at the surface of an active monomer (comprising an anchoring group for attachment of a molecule having at least one complementary reactive group) (Page 5, lines 8-11)

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103(a) of the other invention.

During a telephone conversation with Raymond O. Linker Jr. on 07/14/2008 a provisional election was made with traverse to prosecute the invention of Group I , claim 1-8, 17-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-16 and 21 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to

Art Unit: 4152

be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Claim Rejections - 35 USC § 112

Regarding Claim 1, the phrase "optionally" renders the claim indefinite because the claim includes elements not actually disclosed (those encompassed by "optionally"), thereby rendering the scope of the claim unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bertrand (WO 2002/098926) in view of Masunaga (3,759,797).

Regarding Claim 1, Bertrand teaches electro-grafting a strong adherent polymer coating on an electrically conductive surface comprising an electrochemical grafting at the surface of an active monomer (comprising a reactive functional group for attachment of a molecule having at least one complementary reactive group) (Page 5, lines 8-11). Bertrand does not teach using monomeric species which do not contain reactive functional groups or electrografting resulting in 90% of the total functional groups being accessible. Masunaga teaches electrografting monomers to a solid support via electrolytic polymerization which includes monomers with and without reactive functional groups (column 2, lines 17-22). Some of these monomers include metacrylonitrile (nitrile functional group), ethyl acrylate (no functional group), 2-hydroxyethylmethacrylate (hydroxyl functional group), styrene (no functional group), and glycidylacrylate (epoxy functional group) (column 2, lines 17-25). Although Bertrand and Masunaga do not specifically mention 90% accessibility of functional groups, an electrografting process carried out by someone of ordinary skill in the art that properly balances the ratio of "functional group containing" monomers to "non-functional group containing" monomers would be expected to produce an electrografted solid support with the desired functional group accessibility.

It has been held that discovering an optimum value (i.e., ratio) of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Regard Claim 2, Bertrand teaches the use of monomers with a reactive functional group toward nucleophilic compounds. The reactive functional group may be for example a succinimidyl group particularly reactive towards amines or epoxy, a vinyl, an allyl, an aryl, a chloride group or a combination of them (page 13, lines 1-3). When the reactive functional group is part of a preformed polymer, the monomer becomes a macromonomer bearing at least one activated vinylic pendant group (acrylic or methacrylic function) which allows formation of new primer by one-step electro-grafting of a reactive polymer called macromonomer (page 5, line 28-32).

Regarding Claim 3, Bertrand teaches grafted activated vinyl monomers can undergo controlled or uncontrolled ring opening polymerization (referred to by the applicant as molecules that are cleavable by nucleophilic attack) (page 8, lines 23-31).

Regarding Claim 4, Bertrand teaches electoreactive species in the form of acrylates and methacrylates containing an anchoring group (labeled as the X group in diagram page 5) that can be electrografted to conductive surfaces (page 5, lines 7-31). Bertrand mentions glycidyl methacrylate as one of the monomers used in electrografting (page 9, line 9).

Regarding Claim 5, Bertrand teaches the use of lactones and lactides such as (ε-caprolactone), and functional caprolactones such as γ-bromo- ε-caprolactone, or lactide such as D, L-Lactide or any other polymerizable cyclic monomer such as cyclic anhydride (page 9, lines 1-4).

Regarding Claim 6, Bertrand teaches grafting a molecule or macromolecule with a complementary functional group to the surface via polycondensation or polyaddition which include: proteins, enzymes, oligonucleotides, drugs, dyes, or small organic molecules of particular interest like electroactive molecules (aminoferrocene), vitamine (biotine), and ligands (page 13, lines 10-18).

Regarding Claim 7, Bertrand teaches electrografting reactions on steel, stainless steel, Inox316L, tantalum, titanium, nitinol, carbon, ITO glass, transition metal (Fe, Ni, Cu, Au, Ag,...), metal doped polymers (page 6, lines 30-32).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bertrand (WO 02/098926) in view of Mausunga and futher in view of Guiseppi-Elie (5,766,934)

Regarding Claim 8, Bertrand and Mausunga teach the invention discussed above and Bertrand further teaches electrografted coatings of polymers such as polyhydroxyethylacrylate to be deposited on the conducting substrates with a strong adhesion and an increased and tunable thickness (controllable thickness) (page 9,

Art Unit: 4152

lines 18-20). Bertrand fails to teach the density of accessible functional groups.

Guisseppi-Elie teaches electropolymerization providing a unique and convenient method for precise control of polymer film thickness by control of the electropolymerization charge density (column 2, lines 46-55). It would have been obvious to a person of ordinary skill in the art to combine Bertrand with Guisseppi-Elie because Guisseppi-Elie provides a method for precise control of polymer film thickness which leads to convenient surface functionalization by subsequent blending with other molecules such as polypeptides. (Column 2, lines 57-61).

Moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the density for the intended application, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Claim 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bertrand (WO 2002/098926)

Regarding Claims 17-20, Bertrand teaches electrografted acrylates or methacrylates containing an anchoring group for attachment of a molecule having at least one complementary reactive group (page 5, lines 20-26). The process allows the grafting onto the initial coating by compounds like functional polymers such as, protein, peptide, oligonucleotide (defined as DNA chips, page 4, line 28), dyes, drugs, and anti-bacterian compounds (page 6, lines 9-11).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on (571)272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

gdc

/Joseph S. Del Sole/
Supervisory Patent Examiner, Art Unit 4152